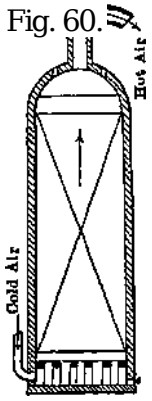
the hot-blast valve was connected to the lower part of the stove. It may be readily seen that the currents of gas and air in this apparatus were circulated in the wrong direction; that is, in the opposite direction to the natural convection currents.

Cowper afterward perceived the error in the gas circulation in his early design, and in later designs the currents of gas and air were circulated in the correct direction (Fig. 70). Combustion took place in a central or eccentrically placed chamber, the hot gases rising to the dome where they were reversed and subdivided among a number of parallel passes down through the checkerwork. Uniting in a lower chamber, they, were then carried away through the chimney valve. The cold blast entered the stove chamber below the checkerwork, through which it passed upward in a number of parallel streams to the dome of the stove. There it changed its direction and passed downward through

the combustion chamber to the hot-blast valve. The Cowper hot-blast stove

Fig. 60.




The single weak point of the Cowper hot-blast stove lies in the location of the combustion chamber, which, in the form of a vertical tube, or chamber, occupies a very large amount of space and is very poorly adapted for the purpose for which it is employed. The attempts to improve the design of these stoves should be directed toward the elimination of this tube for the combustion chamber. The space located

immediately below the dome of the stove might be employed for a combustion chamber, as is suggested below. Moore's patent (Fig. 60) shows a single-pass construction of this character, but is badly worked out. In Moore's stove the hot gases of combustion pass upward, in the opposite direction to their natural convection currents.

The first modification of the Cowper stove was made by